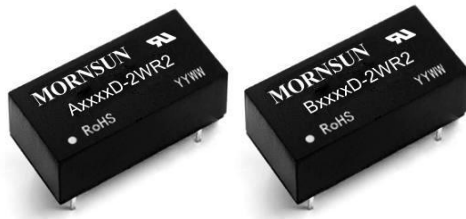


2W, Fixed input voltage, isolated & unregulated dual /single output



### FEATURES

- Operating temperature range: -40°C to +85°C
- High efficiency up to 84%
- High power density
- Compact DIP package
- Isolation voltage: 1500VDC
- No external component required
- International standard pin-out
- IEC60950, UL60950, EN60950 approval

UL<sup>®</sup> CE CB Patent Protection RoHS



A\_D-2WR2 & B\_D-2WR2 series are specially designed for applications where an isolated voltage is required in a distributed power supply system. They are suitable for

1. Where the voltage of the input power supply is stable (voltage variation:  $\pm 10\%V_{in}$ );
2. Where isolation between input and output is necessary (isolation voltage  $\leq 1500VDC$ );
3. Where the output voltage regulation is not strictly required;
4. Typical application: digit circuit condition; normal low-frequency artificial circuit condition; relay drive circuit and data switching circuit condition, etc.

### Selection Guide

Certification	Part No.	Input Voltage (VDC)	Output		Efficiency (%Min./Typ.) @ Full Load	Max. Capacitive Load*( $\mu F$ )
		Nominal (Range)	Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
--	B0303D-2WR2	3.3 (2.97-3.63)	3.3	400/40	66/70	220
	B0305D-2WR2		5	400/40	74/78	
UL/CE/CB	A0505D-2WR2	5 (4.5-5.5)	$\pm 5$	$\pm 200/\pm 20$	76/80	100
	A0509D-2WR2		$\pm 9$	$\pm 111/\pm 11$	80/84	
	A0512D-2WR2		$\pm 12$	$\pm 83/\pm 8$	80/84	
	A0515D-2WR2		$\pm 15$	$\pm 67/\pm 7$	80/84	
	A0524D-2WR2		$\pm 24$	$\pm 42/\pm 4$	80/84	
--	B0503D-2WR2	5 (4.5-5.5)	3.3	400/40	70/74	220
	B0505D-2WR2		5	400/40	76/80	
	B0509D-2WR2		9	222/22	80/84	
	B0512D-2WR2		12	167/17	80/84	
	B0515D-2WR2		15	133/13	80/84	
	B0524D-2WR2		24	83/8	80/84	
--	B0915D-2WR2	9 (8.1-9.9)	15	133/13	79/83	220
UL/CE/CB	A1205D-2WR2	12 (10.8-13.2)	$\pm 5$	$\pm 200/\pm 20$	76/80	100
	A1209D-2WR2		$\pm 9$	$\pm 111/\pm 11$	80/84	
	A1212D-2WR2		$\pm 12$	$\pm 83/\pm 8$	79/83	
	A1215D-2WR2		$\pm 15$	$\pm 67/\pm 7$	80/84	
	A1224D-2WR2		$\pm 24$	$\pm 42/\pm 4$	80/84	
	B1205D-2WR2		5	400/40	76/80	220
	B1209D-2WR2		9	222/22	79/83	
	B1212D-2WR2		12	167/17	78/82	
	B1215D-2WR2		15	133/13	80/84	
	B1224D-2WR2		24	83/8	80/84	
--	A1515D-2WR2	15 (13.5-16.5)	$\pm 15$	$\pm 67/\pm 7$	77/81	100

UL/CE/CB	A2405D-2WR2	24 (21.6-26.4)	±5	±200/±20	75/79	100
	A2409D-2WR2		±9	±111/±11	80/84	
	A2412D-2WR2		±12	±83/±8	79/83	
	A2415D-2WR2		±15	±67/±7	80/84	
	A2424D-2WR2		±24	±42/±4	80/84	
	B2405D-2WR2		5	400/40	75/79	220
	B2409D-2WR2		9	222/22	81/85	
	B2412D-2WR2		12	167/17	79/83	
	B2415D-2WR2		15	133/13	80/84	
	B2424D-2WR2		24	83/8	80/84	

Note: \*The capacitive loads of positive and negative outputs are identical.

### Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	3.3V input	--	777/40	--/70	mA
	5V input	--	500/35	--/60	
	9V input	--	278/25	--/60	
	12V input	--	208/20	--/50	
	15V input	--	159/15	--/35	
	24V input	--	105/10	--/30	
Reflected Ripple Current		--	15	--	mA
Surge Voltage (1sec. max.)	3.3V input	-0.7	--	5	VDC
	5V input	-0.7	--	9	
	9V input	-0.7	--	12	
	12V input	-0.7	--	18	
	15V input	-0.7	--	21	
	24V input	-0.7	--	30	
Input Filter		Filter capacitor			
Hot Plug		Unavailable			

### Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy		See tolerance envelope graph (Fig. 1)				
Line Regulation	Input voltage change: ±1%	3.3V output	--	--	±1.5	--
		Others output	--	--	±1.2	
Load Regulation	10%-100% load	3.3VDC output	--	15	--	%
		5VDC output	--	12	--	
		9VDC output	--	9	--	
		12VDC output	--	8	--	
		15VDC output	--	7	--	
		24VDC output	--	6	--	
Ripple & Noise*	20MHz bandwidth	--	75	200	mVp-p	
Temperature Drift Coefficient	100% load	--	--	±0.03	%/°C	
Short Circuit Protection**	B03xxD-2WR2 A12xxD-2WR2/B12xxD-2WR2 A15xxD-2WR2/B15xxD-2WR2 A24xxD-2WR2/B24xxD-2WR2 A0512D-2WR2/A0515D-2WR2 A0524D-2WR2/B0524D-2WR2 Others	--	--	1	s	
		Continuous, self-recovery				

Note: \*Ripple and noise tested with "parallel cable" method, please see *DC-DC Converter Application Notes* for specific operation methods.

\*\*Supply voltage must be discontinued at the end of short circuit duration for B03xxD-2WR2 series, A12xxD-2WR2/B12xxD-2WR2/A15xxD-2WR2/B15xxD-2WR2/A24xxD-2WR2/B24xxD-2WR2 series, and A0512D-2WR2/A0515D-2WR2/A0524D-2WR2/B0524D-2WR2 models.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Insulation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	1500	--	--	VDC	
Insulation Resistance	Input-output, insulation voltage 500VDC	1000	--	--	MΩ	
Isolation Capacitance	Input-output, 100KHz/0.1V	24V Input	--	50	--	pF
		Other input	--	20	--	
Operating Temperature	Derating if the temperature $\geq 85^{\circ}\text{C}$ (see Fig. 2)	-40	--	85	°C	
Storage Temperature		-55	--	125		
Casing Temperature Rise	Ta=25°C	--	25	--		
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300		
Storage Humidity	Non-condensing	--	--	95	%RH	
Switching Frequency	100% load, nominal input voltage	--	100	--	KHz	
MTBF	MIL-HDBK-217F@25°C	3500	--	--	K hours	

Physical Specifications

Casing Material	Black flame-retardant and heat-resistant plastic(UL94 V-0)
Dimensions	20.32*10.16*8.20mm
Weight	2.8g(Typ.)
Cooling Method	Free air convection

EMC Specifications

EMI	CE	CISPR32/EN55032	CLASS B (see Fig. 4 for recommended circuit)
	RE	CISPR32/EN55032	CLASS B (see Fig. 4 for recommended circuit)
EMS	ESD	A_D-2WR2	IEC/EN61000-4-2 Contact ±6KV perf. Criteria B
		B_D-2WR2	IEC/EN61000-4-2 Contact ±8KV perf. Criteria B

Product Characteristic Curve

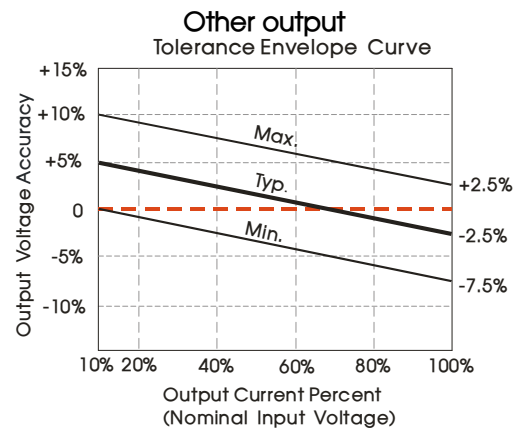
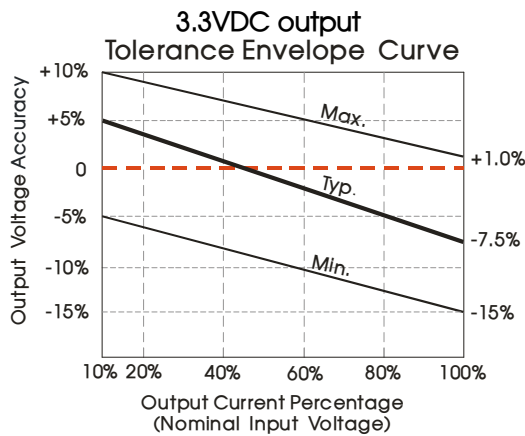


Fig. 1

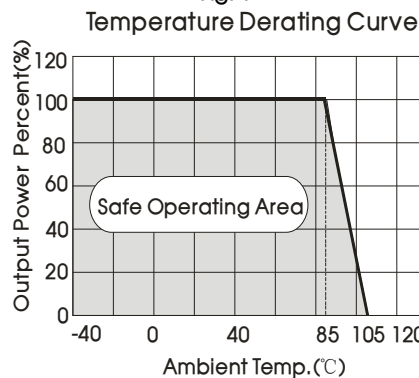
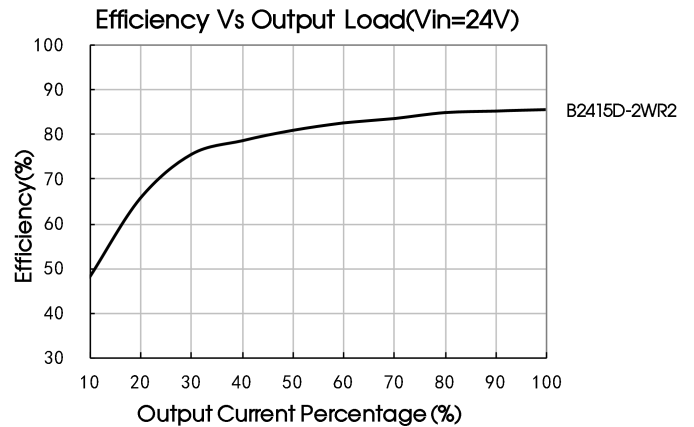
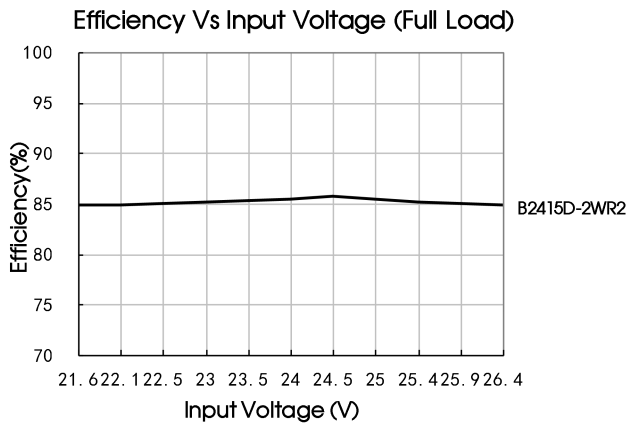
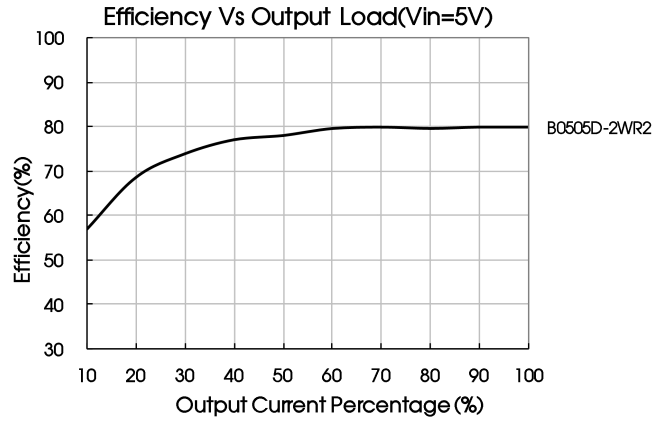
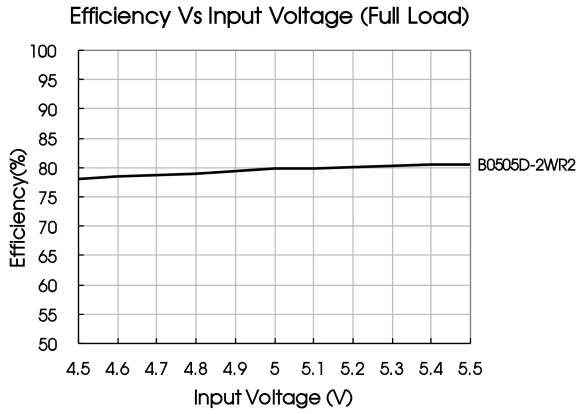


Fig. 2



## Design Reference

### 1. Typical application

If it is required to further reduce input and output ripple, a filter capacitor can be connected to the input and output terminals, see Fig.3. Moreover, choosing suitable filter capacitor is very important, start-up problems may be caused by too large capacitance. To ensure the modules running well, the recommended capacitive load values as shown in Table 1.

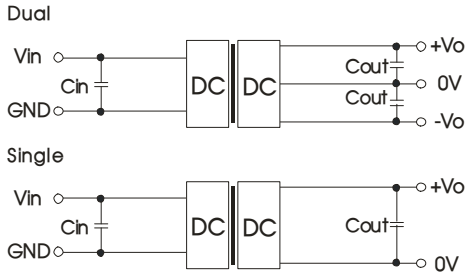


Fig.3

Recommended capacitive load value table (Table 1)

Vin (VDC)	Cin (μF)	Single Vout(VDC)	Cout (μF)	Dual Vout(VDC)	Cout (μF)
3.3	4.7	3.3	10	±5	4.7
5	4.7	5	10	±9	2.2
9	2.2	9	4.7	±12	1
12	2.2	12	2.2	±15	0.47
15/24	1	15/24	1	±24	0.47

### 2. EMC typical recommended circuit (CLASS B)

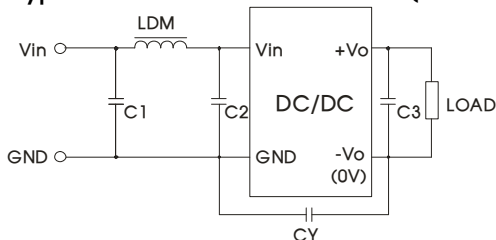


Fig.4

EMI	Input voltage (VDC)	3.3/5/9/12/15	24
	C1/C2	4.7μF /50V	
C3	Refer to the Cout in Fig.3		
CY	--	1nF/2KV	
LDM	6.8μH		

Note: 1. 24V input series is subject to CY (CY : 1nF/2KV).  
2. It is not needed to add the component in the peripheral circuit when parameter with the symbol of "--".

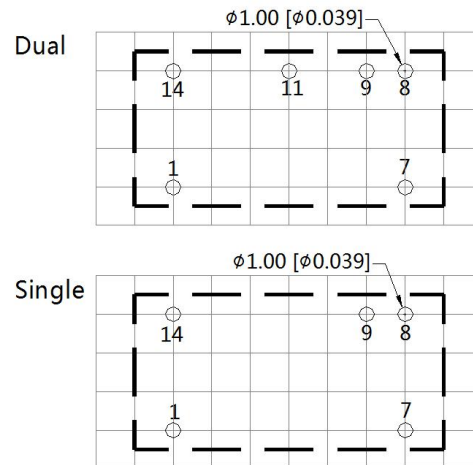
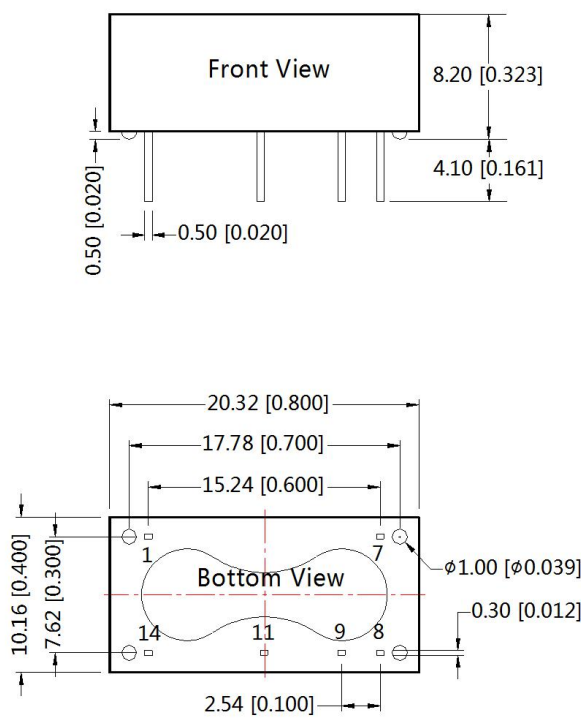
### 3. Output load requirements

In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor on the output side (The sum of the efficient power and resistor consumption power is not less than 10%).

4. For more information please find the application notes on [www.mornsun-power.com](http://www.mornsun-power.com)

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION 



Note : Grid 2.54\*2.54mm

Pin	Pin-Out	
	Single	Dual
1	GND	GND
7	NC	NC
8	0V	0V
9	+Vo	+Vo
11	No Pin	-Vo
14	Vin	Vin

NC: Pin to be isolated circuitry

Note:  
Unit: mm[inch]  
Pin section tolerances:  $\pm 0.10[\pm 0.004]$   
General tolerances:  $\pm 0.25[\pm 0.010]$

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from [www.mornsun-power.com](http://www.mornsun-power.com). Packing bag number: 58200009;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. The maximum capacitive load offered were tested at input voltage range and full load;
4. Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^\circ\text{C}$ , humidity<75%RH with nominal input voltage and rated output load;
5. All index testing methods in this datasheet are based on our Company's corporate standards;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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